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ABSTRACT

This catalog identifies exemplary educational programs endorsed by the Roger Lang Clearinghouse for Circumpolar Education. The Clearinghouse was established in 1989 to promote local control of Native education in the Arctic regions of Alaska, Canada, Greenland, Norway, Sweden, Finland, and Russia. Major challenges facing communities, educators, and researchers in the Arctic include: developing genuine culture-based materials; redefining the goals of schooling; developing new materials and programs; conducting research pertaining to instruction in traditional Native sciences; correcting deficiencies in science and math education; translating research by Arctic scientists into materials for school and community use; and identifying additional funding. This catalog describes 28 programs developed by teachers and administrators in elementary, junior high, and secondary science; elementary and secondary interdisciplinary programs; cultural education programs; teacher education programs; and programs involving educational evaluation and school district reorganization. Each profile includes grade level and contact information. Also included is information on library and other instructional resources related to circumpolar education, criteria for exemplary programs and a program nomination form, and a Clearinghouse publication order form. (LP)

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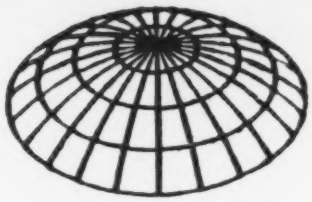

THE ROGER LANG CLEARINGHOUSE FOR CIRCUMPOLAR EDUCATION

THE WHOLE POLE CATALOGUE of Exemplary Programs in Circumpolar Education 1992-3 Edition

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HOW TO USE THIS CATALOGUE

The 1992-93 edition of the Whole Pole Catalogue is a publication of the Roger Lang Clearinghouse for Circumpolar Education. It is intended to provide an overview of exemplary programs in elementary and secondary education endorsed by the Clearinghouse during its third year of operation. Many of the 1992-93 programs were also included in the first edition (1991) of the Whole Pole Catalogue; several of these have been revised and expanded to reflect new developments. Other programs are new to this edition.

Nominations of other exemplary programs, particularly in math, science, social science and interdisciplinary approaches, are welcomed at any time. The Nomination Form can be found at the back of the Catalogue. The Whole Pole Catalogue is published annually in the fall.

Teachers and others working with the Clearinghouse to pilot the use of circumpolar resources in Alaskan communities should use the Catalogue to identify potential partners for exchanges, request additional information, and then, together with the staff of the exemplary program, submit a request to the Clearinghouse for travel or other funds. Exchanges funded during the 1992-93 school year must have strong science and or math components. Clearinghouse staff will assist in developing plans and budgets for exchanges and in arranging travel.

While the Whole Pole Catalogue is intended primarily to facilitate exchanges of information and staff between schools districts, Native organizations and others participating in the Roger Lang Clearinghouse, any individual or institution is invited to contact the Clearinghouse's International Office or the programs for more information.

Major funding for this and other Clearinghouse activities is provided by the Science and Mathematics Education Networks Program of the National Science Foundation.

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INTRODUCTION

Circumpolar Education: A Geographic and Cultural Perspective

The circumpolar North has been called "the only round nation in the world". Arctic and subarctic in climate, the area has been home to Inuit (Eskimos and Aleuts), Dene (Athabascans), Tlingit/Haida/Tsimshian, and Saami (Lapps) as well as other Native peoples for thousands of years. These people are now citizens of the United States (Alaska), the territories and provinces of Canada, Denmark (Greenland), Norway, Sweden, Finland and Russia. National boundaries cut across territories traditionally occupied by indigenous groups who have shared languages and cultures.

While a number of Native people have moved to northern cities like Anchorage and Yellowknife which have sprung up in the last 100 years, many still live in villages where they are the majority population. These communities range in size from 50-100 to several thousand inhabitants. Outside of Scandinavia, most are unconnected to road systems. Cable News Network, MTV and long distance phone and fax communications are now part of village life. Most small communities in the circumpolar world are working to preserve aspects of traditional life while importing positive elements of southern society.

Involvement of Communities: A Philosophy of Education

The indigenous peoples of the North are faced with opportunities and problems which transcend national boundaries. Isolation, changing lifestyles, cultural differences from dominant "southern" populations, resource development and other demands of technological societies are factors which link the villages of Alaska, Canada, Greenland, the Russian Far East and northern Scandinavia more closely to one another than to urban areas within their individual nation-states. Shared, as well, are Arctic ecosystems -- the total physical environment of which human settlements are a part. Acknowledging the bonds among them, the Native people of the circumpolar world have since the early 1970's been regularly meeting to discuss common concerns.

Chief among these concerns is education. Across the North, individuals and institutions are seeking ways to increase decision-making and control of educational programs by local communities. Formal schooling has traditionally been the purveyor of cultural change. As elementary and secondary education increasingly comes under local control, respect for traditional ways and recognition of human and other resources within communities are increasing.

Major challenges facing communities, educators and researchers in the Arctic include:

- **development of genuinely Inuit, Dene and other approaches to education, not just the sprinkling of cultural materials through approaches designed by southern systems.** Native and other northern educators, most of whom have been trained in southern systems, will have to think outside the boundaries of the systems in which they were trained.
- **the need for redefinition of the purposes of schooling.** Southern goals espoused by non-Native teachers are not necessarily the goals of Arctic residents. Parents and educators, both Native and non-Native, must agree on goals. Movement is needed on both sides. Some parents do not recognize the value of formal education. Some teachers and administrators see preparation for college as the only desirable goal. The goals of schooling must be agreed upon and then reflected in ongoing school district operations.
- **development of new materials and programs.** Over the years many materials have been lost. Institutional memory is lacking. Exemplary materials are few -- particularly in math and sciences and for upper level coursework in all subject areas. The processes and commitment for the creation of culturally-based programs and materials are in place in some school systems, but inadequate funds and staffing are limiting development.
- **a particular need for research and development of instructional processes and materials which investigate and teach traditional Native sciences and technologies including methods of land and resource management.** The relationship between western and indigenous science must be more fully explored and defined.
- **Arctic residents working with other educators to correct deficiencies in science and math education identified in the south and mirrored in the Arctic**, e. g. inadequate teacher preparation, fewer students choosing upper level courses, too much reliance on textbooks and not enough on experiential approaches, students seeing little 'real-life' use for science.
- **the need to translate more directly the research done by scientists and other professionals in Arctic communities into materials for school and community use including elementary and secondary education.**
- **identification of additional funding.** Severe budget cuts at the state/provincial, district/divisional board and individual school level are retarding the development of new approaches to elementary and secondary education. This drop in public sector funding is compounded by limited private foundation support in the Arctic. Private sector support is restricted by the perception that oil and other resources have generated sufficient funds for education and other needs.

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LANG CLEARINGHOUSE: Statement of Purpose and History

Canadian, Greenlandic, Saami and Russian educators and institutions, both Native and non-Native, have for several decades been developing instructional materials and teaching approaches in an effort to meet needs similar to those identified in Alaska. Recognizing shared educational problems with the other communities of the circumpolar world and wishing educators, both Native and non-Native, to learn from the successes and failures of programs elsewhere in the North, the Roger Lang Clearinghouse for Circumpolar Education began operations in 1989.

The goals of the Roger Lang Clearinghouse for Circumpolar Education are :

(1) to increase decision-making and control of educational programs by local communities; (2) to work with Native peoples and institutions having an education function to more clearly define the purposes of schooling and (3) and to influence these institutions to adopt new approaches to the design of programs, to career preparation, to expectations of student performance and to teacher training.

Key components of the Clearinghouse include:

- **Creation and maintenance of a network** of individuals and organizations concerned with the quality of education in the Arctic and willing to share their experiences and approaches with others through fax machines, telephones, printed materials and occasional visits through conferences or other travel. The Clearinghouse's International Office maintains contact with all network participants and matches them up with others seeking or providing information.
- Publication of a **newsletter** three times a year.
- A **Circumpolar Curriculum Library**, composed of materials contributed by Canadian, Greenlandic, Scandinavian and Alaskan educators and institutions. Materials are shared but also safeguarded so that what has been accomplished will not vanish.
- **Establishment of a set of criteria and a nomination process for exemplary programs** which are described annually in the Whole Pole Catalogue.
- **Exchanges of educators.** These intensive visits allow for the transfer of effective programming and the tailoring or circumpolar models to individual community or regional needs.

HOW EXEMPLARY PROGRAMS WERE IDENTIFIED

The identification of exemplary programs began with the establishment by the Alaska Steering Committee of the Roger Lang Clearinghouse of a list of criteria to be used by staff and others in identifying those programs. At its November 1990 meeting in Anchorage, the Steering Committee established criteria for exemplary programs. A Nomination Form for Exemplary Programs in Circumpolar Education, including the criteria identified by the Alaska Steering Committee, may be found at the end of this Catalogue. While the Clearinghouse's primary focus is in the Arctic, it seeks welcomes nominations

of exemplary education programs serving indigenous populations anywhere in the world.

The information contained in the Whole Pole Catalogue is drawn from submitted Nomination Forms, data collected on site visits by Clearinghouse staff, other statements prepared specifically for the Catalogue by participating institutions and materials drawn from the Clearinghouse's Curriculum Library. Copies of completed nomination forms, letters of recommendation and other program information may be requested from the International Office of the Lang Clearinghouse.

EXEMPLARY PROGRAMS IN ELEMENTARY SCIENCE

LINKING LITERACY AND SCIENCE (ALASKA)

Grade Level: 2

Contact: **Annie Ronsse and Alice Smith**
Fairview Elementary
1327 Nelchina
Anchorage, AK 99501

phone: 907-279-0671

In a letter endorsing the nomination of this program, principal D.S. Combs wrote: "My second grade students have been historically weak in the science area because of our belief in the importance of the basics of reading, mathematics, and writing. We at Fairview School have been looking for ways to incorporate the learning of science across the curriculum. Mrs. Ronsse's program has done this. I can now ask my second graders about the scientific process, and instead of being met with blank, unknowing stares, I'm greeted by a 5-minute dissertation on the subject and an admonition that if I spent more time in second grade, I would have known the answer to that question".

Initiated through a teacher incentive grant from the Alaska Science and Technology Foundation, the purpose of "Linking Literacy and Science" is to increase exposure of second grade students to science through language activities, non-fiction literature, and hands-on science investigations while, at the same time, assisting with development of reading and writing skills and cultivating a positive attitude about science. An after-school science club for all elementary students has been created and parent and community involvement is encouraged through speaker presentations, science fair projects, Family Science Night, and an Educational Fair.

Science is integrated throughout thematic instruction and special emphasis is put on the development of an emergent literacy strand using Rigby non-fiction big books, basal readers, science poetry, songs and wall charts. The intent is to provide stimulating science instruction while giving the lower third of the grade population, including mainstreamed resource children, time to grow in reading and writing. Science especially lends itself to emergent writing activities in learning logs, observation charts, graphs, diagrams and journals.

Eighty percent of the Fairview student population is minority and speakers depicting women and minorities in the science and technology fields are regular visitors to the classes. Other program activities include field trips to see scientists in action and publication of a science-orientated newspaper.

A second grade survey at the end of the 1991-92 school year indicated that 94% of the students had a positive, happy attitude about science, 6% were indifferent and 0% indicated a negative attitude about science. In response to the question, "Are you a scientist?", 59% of responses said "yes", 35% said "no", and 6% added a response of "not yet" or "partly". When the students were asked to draw a scientist with the tools they might use, girls drew female scientists and boys male scientists. Minorities were represented heavily in the students' illustrations of scientists.

SCIENCE: The Refocuser (ALASKA)

Contact: Jackie Farr
Muldoon School
515 Cherry Street
Anchorage, AK 99504

phone: 907-337-9591 (work) 907-338-3592 (home)

The goals of SCIENCE: The Refocuser are to test the hypothesis that short hands-on science activities will modify and refocus student's behavior and also to develop an interest in science among elementary students. Particular emphasis is also placed on woman scientists and on the use of outdoor field trips.

Specific components of the program include 150 pre-assembled mini science activities to be used by students at a moment's notice. Examples include Bubble Frames, Stored and Released Energy, Snow Crystals, Magnetism, Operation Physics, as well as an activity making Glurch, Oleluk and Slime and comparing them for stickiness, elasticity and fluidity. Activities last from five minutes to several hours and are designed to complement and strengthen the existing science program by providing additional experience in data collection and analysis, hypothesizing, graphing and charting, prediction and the scientific method in general. Each activity is boxed and includes up to 25 small student packets ready for immediate use.

Participating students are given a survey at the beginning of the school year to see how much they know, or are aware of, in science. At the end of the school year they are given the same survey to see what they have gained from the activities and experiences during the year. Students keep a Science Journal to help them monitor what they have learned. During the 1990-91 school year, 22 of 23 students turned in project's for the Science Fair.

Jackie Farr, the fourth grade teacher who created SCIENCE: The Refocuser, reports that "the most successful aspect of the program is that the students are developing a real love for science. They want to know if we are going to do science and when we are going to do science. I am getting 100% participation in science.....The parents of the students have been very

appreciative and supportive. The students behave and do their work if they think they are going to be rewarded with a science activity."

As she developed the program, Mrs. Farr kept a log containing a list of materials in each activity, a source and cost list for each item needed, written instructions to students and directions to teachers. The intent of the log is to enable other teachers to easily replicate the project.

In an endorsement letter, Heather Roses, a student in Mrs. Farr's fourth grade class during in 1990-91, described what went on in the classroom:

> "The students did science experiments in class, such as growing slime and studying about oil spills. We mixed oil and water together and experimented with different ways to get the oil out of the water. We took a small necked jar and put a lit piece of paper in it. Then we set a soft boiled egg on top of the jar. The egg was sucked into the jar. We put a bunch of fluid into a tube and it blew up like a volcano. We also made paper air planes to see how far they would fly. We did another neat one. We made lots and lots of huge bubbles. We also took a yard stick, put weight on one end and piled newspapers on the other end to see how many newspapers it would take to be really heavy. In another experiment we blew up a garbage bag. The class sat on it to see how much weight it would hold before breaking.....Mrs. Farr did many science experiments, projects and field trips throughout the year. It made me like science a lot more than I did before I had her as a teacher."

SWANSON ELEMENTARY: A Schoolwide Commitment to Hands-On Science (ALASKA)

Contact: **Rose L. Anderson, Principal**
Swanson Elementary School
609 N. Gulkana
Palmer, AK 99645

phone: 907-745-3227 fax: 907-745-1021

The Clearinghouse sent Nomination Forms to all teachers receiving grants from the Alaska State Department of Education during the 1991-92 school year to develop innovative science projects. Three of these grants, SCIENCE THROUGH FOOD: I Wonder How and Why, FAMILY SCIENCE and LIFE LAB: A Growing Adventure, were awarded to teachers at a single elementary school in Alaska's Matanuska-Susitna Valley, just north of Anchorage. A letter which accompanied the completed Nomination Forms explained this clustering of excellence:

> "At Swanson we have made a proactive commitment to providing a quality primary hands-on science curriculum for our Kindergarten through second grade school population. Our commitment has been enhanced by the $18,000 in innovative science grants that we received

from the State of Alaska this year. I actively encourage our staff to share their expertise with other schools....."

The Clearinghouse suggests that circumpolar institutions give consideration to the Swanson Elementary projects both as a model for school-wide commitment to science education as well as for their potential merit as individual projects.

Gary Holsten, Chairperson of the Alaska Northwest Aquatic and Marine Educators, has written the Clearinghouse that "the teachers at Swanson have created science activities that are matched to the cognitive base of their students. They have given these activities a community base and they have decided to insure that all this activity should be fun and should become part of the annual culture of their school."

Science Through Food: I Wonder How and Why - Beth Cline (K-2)

A familiar medium such as food is used to motivate younger children in the scientific areas of biology, chemistry and environmental science. The process employed includes a multi-sensory approach which is inter-disciplinary in nature. This project emphasizes science but also impacts all curriculum areas. The children are immersed in different activities that strengthen their oral and written language including exposure to new vocabulary. Their math skills are improved through activities that include graphing, counting, measurement, sorting and classifying. Socialization is also a very important part of this program. Children learn to work in small groups with adults and they learn to interact with community members.

The project breaks the food cycle into four parts: growth, processing, consumption and waste. Under growth and processing, project activities include incubating chicken eggs in the classroom, growing various types of food plants in different mediums and processing of a variety of foods (potatoes into french fries, pumpkin into pie, wheat into bread). The role of cooking as chemistry is extensively explored.

The area of consumption is explored through child-centered cooking projects, visits to the school's kitchen and restaurants and study of how foods affect their bodies. Waste is studied through recycling. This includes plant waste (composting), processing waste (recycling) and human waste (sewage treatment). Children do some small-scale composting and observe the physical changes that take place. Through observation of various materials they can also experiment and observe what does not decompose and how to help the process get started. They also set up areas to recycle school waste.

This project can be coordinated with other classes doing life cycle studies and/or growing plants. Plants from other classes can also provide controls to compare with plants being grown by children involved in the Science Through Food project.

Judy Sommers, President of the Swanson/Sherrod PTA has endorsed the project because "it takes what the students learn at school and relates it to their everyday lives. It also makes it easier for the parents to continue the educational process at home. (It) utilizes community support in imple-

menting the program. This shows students that others also find what they do and learn important."

While emphasis is placed on students growing, harvesting, processing, cooking and tasting peas, potatoes and daily products which are the major crops of the Mat-Su Valley, the activity can be recreated using whatever foods are part of the local economy.

Family Science - Geraldine Binder and Patricia Gray (K-3)

This project centers on science bags which are taken home by students for one week periods. The bags include several non-fiction books on each topic, several simple experiments or activities, the hands-on materials needed, data sheets and easy directions for parents. The project's goals include providing students more opportunities for hands-on science activities; encouraging reading about, and exploration of, science topics as a family in a relaxed atmosphere at home; involving parents in their child's science education; and engaging the total school/community in science education for all children. The project was developed as a response to parents inquiring how they might help their children at home.

The project allows the parents to become teachers, both promoting and reflecting cultural and community resources and values. It allows the student to take direction for his or her own learning while sharing knowledge with other members of the family. Lifelong thinking skills and a joy of learning are encouraged.

Frederick Goodwin, a former instructor in the Extended Learning Program (Gifted and Talented) at Swanson Elementary, has written: "I feel the Family Science project has great merit and will fill the need for a school/ home link in science education. This project not only challenges and interests the students, but also allows for the wide range of learning styles and strengths."

Life Lab: A Growing Adventure - Nancy L. Little (1-6)

A garden-based science program, LIFE LAB, uses The Growing Classroom developed in California as its curriculum base. Skills involved include observing, communicating, comparing, organizing, relating, inferring and applying. Personal health is emphasized with a goal of impacting life-long habits and quality of life. There is also a strong environmental component which emphasizes the interdependence of humans and their environment. Parent and other volunteers are sought to increase adult/child ratio, provide diversity for student interaction, and offer expertise.

LIFE LAB activities may be applied to all subject areas. Activities include:

Sinking Ship - Students solve a problem in a cooperative manner through the use of a simulated disaster;
Knots - Students form a web with their connected hands. They are challenged to untangle knots without speaking or dropping hands;
Sensual Soil - Students use all of their senses to discover the qualities

of different soils;
Big Mac Attack - Students connect a common fast food to the four basics of air, water, sun and soil;
Adapt-a-Seed - Students discover some plant adaptations for survival;
More Geotropism - Students observe the effect of gravity on plants;
The Power of the Circle - Students learn the cycles of water, nutrients and oxygen in plants;
Caught in the Web - Students examine the dependencies in their community and on the school site;
Bitecycle - Students observe insect life cycle and food chain;
Pretzel Hog - Students explore energy needs by playing a game with pretzels for fuel;
Self-survey of Garbage Habits - Students and families can become involved together;
I Eat My Peas With Honey - Introduces to the student the individual decision making process in choosing food;
How Do We Make a Horse Into Jello? - Students learn that all foods come from plants and animals;
When I Was Little - Students and elders explore how eating habits have changed over time.

In her transmittal letter to the Clearinghouse, Swanson Elementary Principal Rose Anderson writes of the garden-based science program: "Every first and second grade classroom at Swanson is alive with a Growlab.....I was amazed one morning to walk into a first grade classroom and observe the students harvesting thumb-size radishes from their indoor garden.....The implications of the program for rural Alaska and other Northern climates are quite far-reaching. For students to be involved in the hands-on growing of vegetables and flowering plants to enhance their daily living is a powerful teaching tool with extensions into every part of the curriculum.....The program has made a strong impact on Swanson and the integrated reading and writing curriculum that we advocate here."

SEA and RIVER WEEK (ALASKA)

Grade Level: K-6

Contact: Annie Calkins, Director of Curriculum
Juneau School District
10014 Crazy Horse Drive
Juneau, Alaska 99801

phone: 907-789-4543 fax: 907-789-4488

The Alaska Sea Week Program introduces elementary students to multiple aspects of the marine environment through a concentrated field-based study which occurs throughout the Juneau School District each spring. Through Sea Week students may gain an increased interest in their environment, a greater awareness of the natural world and a respect for it, and a sensitivity to the relationship between themselves and the environment.

At each grade level a different aspect of marine environment and life is taught through a series of interdisciplinary activities: Kindergarten Overview of the Sea Environment; First Marine Mammals; Second Mollusks and Shells; Third Glaciers and Algae; Fourth Marine Birds and Wetlands; Fifth Fish and Fisheries; and Sixth People and the Environment.

Juneau Sea Week began twenty-two years ago at the Auke Bay School with intertidal studies and was extended district-wide through the leadership of parent volunteer Mary Lou King. In 1978 the Alaska Department of Environmental Conservation provided funds to publish the curriculum which had been expanded, with strong professional and community support from federal, state and local agencies as well as parents, to include fisheries, glaciers and wetlands. In the early 1980's Juneau Sea Week expanded to "Sea Month" and was taken statewide by the Alaska Sea Grant Program at the University of Alaska Fairbanks. The curriculum framework remained the same, but application was expanded to include all Alaska marine and fresh-water ecosystems. It was recognized in 1988 by the National Science Teachers Association as one of ten top environmental ed programs in the country. While the Sea Week ecosystems may be unique to Juneau, the application of these studies has world-wide potential. The program was begun, expanded and has continued to be supported by individual members of the community who were interested in making sure the youth of the community could understand and appreciate the natural environment around them.

Hallmark characteristics of the Sea Week Program include:

- Its concrete approach to science education. Students are actively doing things.
- The experimental nature of the program. Children go outside on field trips where environmental learning takes place. It is essentially an out-of-classroom experience.
- It's culturally relevant to the indigenous people of Southeast Alaska. All activities include legends and stories of the Tlingits and other Alaska Natives, and field-based learning includes demonstrating ways indigenous people did things historically.
- It's a community-based program. Many local agencies, citizens and scientists give presentations and assist with field trips. In addition, children, their families and the community at large can go back to the sites over and over again to learn more about the sea and its life.

A member of the Clearinghouse's Alaska Steering Committee and Science Specialist for the Alaska Department of Education, Peggy Cowan endorses Sea Week as "successful in both urban and rural Alaska because it is the kind of program the Clearinghouse Criteria describe. The program not only encourages local involvement, it was developed in Juneau by parental leadership.....The program legitimizes local knowledge of water systems and creatures and because it has continued to make use of community support systems..... The program is ultimately empowering, which is what the Steering Committee is really after. As implemented in Juneau, it empowered the parents and teachers who saw a need and developed a program that eventually has had statewide and national impact. It empowers students who also learn that what they know through their family and out-of-school life is important and valid in an academic setting as well. In its projects it also often empowers students by actual success in social or political action work."

ANCHORAGE SCHOOLS ELEMENTARY SCIENCE PROGRAM (ALASKA)

Grade Level: K-6

Contact: Emma Walton, Science Program Director
Anchorage School District
4600 DeBarr Road / P.O. Box 196614
Anchorage, AK 99519-6614

phone: 907-269-2274
fax: 907-269-2222

The Anchorage Schools Elementary Science Program was created in order to provide elementary school students the opportunity to engage in hands-on science activities and to provide their teachers the resources and confidence to guide those activities. Program components include modular units, inservice training and a science materials center. The hands-on science teaching program began in eight Anchorage schools in 1977 and now reaches students in all of the system's 56 elementary schools.

The Science Center serves as a focal point for elementary science curriculum implementation. Inservice training sessions and grade level graduate credit courses for teachers facilitate the effectiveness of the program. The Center has assembled and maintains approximately 30 main kits with 30 copies of each type and 22 supplemental kits for students in kindergarten through sixth grade. Each kit contains a teacher resource manual and all instructional materials needed for that unit and evaluations. A written scope and sequence identifies science program instructional objectives for each kit. After the kit is used by the classroom teacher, it is returned to the Science Center to be refurbished.

Science kits are designed: (1) for use over a six-week period; (2) to be taught in one hour or shorter segments; (3) to deal with one to three concepts; (4) to involve every student; (5) to work under a variety of conditions; (6) to focus on student learning styles; (7) to promote higher level thinking skills; and (8) to create positive attitudes about science.

Main kits for the kindergarten level are **Dinosaurs** and **Five Senses**; for modified primary: **Sink or Float, Radishes and Rutabagas, Shells** and **Material Objects**; for first grade: **Magnets, Mini Beasts, Plants** and **Weather**; for second grade: **Water, Alaskan Animals, Sound** and **Birds**; for third grade: **Simple Machines, Weather & Climate, Mystery Powders** and **Alaska Plants & Trees**; for fourth grade: **Animal Evidence, Earth Science, Simple Plants** and **Chemicals, Properties & Change**; for fifth grade: **Eco Systems and the Microscope, Electricity and Magnetism, Exploring Properties of Liquid** and **Aviation**; for the sixth grade: **Balloons and Gasses, Geology, Voyage of the Mimi** and **Energy**.

The Anchorage Schools Elementary Science Program received National Exemplar Awards for Elementary Science from the National Science Teachers Association in 1982 and 1989.

INNOVATIVE TRAVELING MAMMAL KITS (ALASKA)

Grade Level: Elementary and secondary

Contact: Tracy L. McFarlin
Peter Evon Memorial High School
P.O. Box 100
Akiachak, Alaska 99551

phone: 907-825-4013 fax: 907-825-4827

The development of mammal kits begins with high school zoology students asking parents or siblings for donations of small mammal hides for tanning. In some instances entire animals are given and students are able to observe appropriate skinning techniques. Students then learn techniques for tanning hides. Completed mammal kits include a tanned hide and skull as well as teacher-developed lesson plan and activity sheets. Lesson plans focus on the lifestyle of each animal and its interrelationship with the people of the area including traditional use. Completed kits are distributed to elementary schools in the Yupiit School District.

Goals for the project include:

- more integration of the Yupik Eskimo way of life into the school;
- presentation of academics in a way which will be more relevant to the students' way of life;
- development by students of a clear understanding of animal habitat and animal structure including fur, bone and muscle; and
- demonstration of a method of treatment of furs which makes the tanned furs stronger and more durable for use in cold weather.

Other important aspects of the project are utilization of the arctic environment, motivation of students to pursue science careers, providing female students opportunities to succeed in science, and demonstrating district commitment to comprehensive change of the educational system.

In her nomination form, teacher Tracy McFarlin stressed the importance of having a student as part of the training team "as there are many successful aspects to the project that students can share with others". Teacher Aide Brian Latham, who has helped develop the kits and is himself a trapper, wrote to the Clearinghouse: "Through this program the kids have gained knowledge of natural balances, the incredible amount of work required to turn an unskinned furbearer into a finished tanned fur and of what it means to feel pride in one's work.....The kids have an intense interest in their natural world. So naturally every time a furbearer's skin was pulled out for tanning an opportunity presented itself to explain relationships in nature.....Additionally, the students received a heavy dose of hard work. I don't imagine any of them expected to soak, scrape, sharpen, invent, wash, apply, mix and comb as much as they did. However, perhaps the most important thing the kids are walking away with is pride in an item they produced. Most elderly women from here are acquainted with the effort required to tan certain skins. A young person who successfully masters the tanning process has automatically gained their respect. Thus the cycle begins: hard work, recognition, pride and finally a desire to work hard."

EXEMPLARY PROGRAMS IN JUNIOR HIGH SCIENCE

Integrating Traditional Knowledge Into Junior High Science

Grade Level: Middle School

Contact: Curriculum Coordinator for the Sciences
School Curriculum Service
Department of Education
Government of the Northwest Territories
Yellowknife, N.W.T. X1A 2L9 CANADA

phone: (403) 873-7675
fax: (403) 873-0155

In 1991 the Northwest Territories Department of Education completed a major revision of the junior high science program intended to provided students, teachers and communities "a view of science education for a changing world". The revision process included a Middle Years Science Needs Assessment soliciting comments from teachers, principals, consultants, superintendents, local education authorities and students; the formation of a Junior High Science Subject Advisory Committee; field validation through a pilot testing process; identification of materials which could be adapted from other sources; and the involvement of aboriginal organizations such as the Dene Cultural Institute.

The completed program outlines the goals for junior high science from the perspective of the different dimensions of the student: intellectual, social, spiritual, physical and emotional. Traditional and local knowledge is considered a key component of the curriculum. The similarities and differences between western science and traditional science are discussed and topic areas for the integration of traditional knowledge are identified.

The Curriculum Document for the program states in its introduction that "science is knowledge obtained through observation and experience. It is one way of looking at the world. Societies everywhere have different ways of interpreting the world around them. How a person perceives their world is called a worldview .....Western science is just one worldview which tries to understand the world using the scientific method. The scientific method refers to a series of steps used by scientists to obtain knowledge about a particular problem. Western science developed out of the traditional science of Europe.....Traditional science or traditional knowledge refers to the worldview of people who do not adhere to the western scientific tradition. Traditional knowledge is an interpretation of how the world works from a particular cultural perspective. It is built up by a group of people through generations of living in close contact with the land. It is based upon their observations and experiences." Differences and similarities between western and traditional science as well as advantages of western science and traditional science are discussed.

Cited as examples of traditional knowledge are hunting practices which ensure conservation of wildlife; preparation and design of clothing, food and

tools; traditional medicine; aboriginal classification systems of natural and social environments; aboriginal taxonomy within classes of plants and animals; traditional knowledge of plants and animals including uses, life cycles and interrelationships; historical perspectives on traditional harvesting; the aboriginal concept of sustainable development; animals viewed as social beings with thoughts and feelings; and a view of humans and nature being inseparably linked.

CAREERS IN ENVIRONMENTAL SCIENCE (ALASKA)

Grade Level: 7th and 4th

Contact: **Gary Cooper**
HC60 Box 3530
Delta Junction, AK 99737

Cheryl Bobo
Box 647
Delta Junction, AK 99737

phone: 907-895-4577

This project, which centers on students going into the field to work with professional scientists, was developed by two teachers in Delta Junction in response to the fact that all too often children learn about science but don't actually do it. The project has four phases.

- Representatives from the State of Alaska Departments of Forestry, Fish (sportsfish division) and Game (wildlife management) and the USDA Soil and Conservation Service come to the classroom to explain their job and the importance of them. They also introduce the equipment which will be used to collect reliable data in the field.
- Seventh grade students are bused to a local area suitable for study. Students are divided into groups of 15 and rotate through four sites, each run by a different agency. Each group spends approximately one hour at each site where they collect data with instruments related to specific professions. At each site students are provided a thorough explanation of why and how the information they collect is used in real life and how this data is important to the monitoring of the environment.
- The following week students are bused to another site where 7th grade students will be teamed with 4th grade students to collect data. Peer tutoring and teamwork enhance the skills acquired by students during their site visit.
- Students return to the classroom to compile, organize and analyze the collected data.

Goals for the project include strengthening student understanding of the role of science in society; students developing a relationship to the environment which is both analytical and emotional; and an increase in student appreciation of the importance of math and science skills for careers in science.

EXEMPLARY PROGRAMS IN SECONDARY SCIENCE

SCIENCE INSTITUTE OF THE NORTHWEST TERRITORIES (SINT)

Grade Level: Secondary and Adult

Contact:
Science Institute of the NWT
Box 1617
Yellowknife, N.W.T. X1A 2P2 CANADA

phone: (403) 873-7592 fax: (403) 873-0227

The Science Institute of the Northwest Territories was created in 1985 under legislation of the Government of the Northwest Territories to provide scientific and technological information to the Legislative Assembly. Four complementary programs have evolved as the Institute has matured: Scientific Services, Science Advisory Service, Technology Development and Information/Education.

The Scientific Services Program offers logistical support to researchers from all parts of the globe while they are in the field. Since 1988 three research centres, formerly operated by the Department of Indian and Northern Affairs have been operated on a year-round basis in Igloolik (in the north Baffin), Iqaluit (in the south Baffin) and Inuvik (in the Mackenzie Delta Region). A test facility has also been opened in Fort Smith.

The Science Advisory Services Program licenses research done within the N.W.T. Through this registration process, information is shared amongst researchers and the northern populace.

The Technology Development Program (TDP), organized in late 1990, brings viable technology to northern businesses and assists northern industry to develop unique technologies for the domestic and international marketplace. Initial research has led to five technological foci: alternative energies, environment, food production, engineering/building science, and traditional knowledge database.

The Institute assists in developing a science culture within the northern society. Through projects of the Information/Education Program, youth and the general public increase their awareness and knowledge of modern and traditional science of particular significance to northerners and of scientific activities conducted within the Northwest Territories. The program's activities include production of science and technology resource materials, operation of cross-cultural science camps for children, and promotion of national science education initiatives such as science fairs.

Resources available from the Science Institute include:

- Science Alive: a compilation of science fair activities with a northern flavor ($15.00);
- Simply Science: a 200 article collection on northern science topics. The first 100 articles are also available on disk for use with the Word Perfect program ($15.00);

- Northwest Territories Scientific Research: a compendium of researchers carrying out studies in the N.W.T. including names and addresses and an abstract of their work. Much of the work is ongoing. Direct contact with the researchers is encouraged (free);
- Science Institute of the Northwest Territories Annual Reports: a summary of program projects on a yearly basis. The 1989 issue describes all programs as a background issue (free);
- Science Institute of the Northwest Territories Newsletters: published on an ad hoc basis to date. Some are general; others are directed to researchers or educators in the N.W.T. (free);
- Science Institute of the Northwest Territories Cross-Cultural Science Camps: a video depicting the activities of the cross-cultural camps which have been recognized by UNESCO as part of the World Decade for Cultural Development 1988-97 (free on a loan basis/$10 to purchase).

NOTE: As a result of recent governmental budgetary restrictions in the NWT, some of the above programs are being restructured and downsized. The Institute is scheduled to relocate to Inuvik in April 1993.

DENE CULTURAL INSTITUTE: Traditional Knowledge Projects on the Environment (NORTHWEST TERRITORIES)

Grade Level: Secondary and Adult

Contact:
Joanne Barnaby, Executive Director
Dene Cultural Institute
P.O. Box 570
Hay River, NWT X0H 0R0

phone: 403-874-8480 fax: 403-874-3867

In a milestone conference held in the Northwest Territories in July of 1987, 200 delegates representing the 26 communities and the 14,000 people of the Dene Nation met to discuss the concerns about the future of their culture. The outcome of the conference was the formation of the Dene Cultural Institute. Its mandate is to preserve and promote Dene culture through the coordination of research and educational activities.

Traditional Environmental Knowledge was chosen as the first area of major research for the Dene Cultural Institute (formed in 1987) because of the central role the land plays in Dene culture, because this knowledge has important applications to western science and resource management, and because this knowledge is fast disappearing with the passing away of elders.

In an August 1991 report documenting a pilot project which gathered traditional environmental knowledge in the communities of Ft. Good Hope and Colville Lake, DCI Research Director Martha Johnson writes that "problems associated with traditional environmental knowledge that make its integration with western science difficult include:

(1) the lack of comprehensive and accurate documentation. Traditional environmental knowledge is passed down through oral tradition and thus is available only in the community of

origin. Often it is revealed through stories and legends, which make it difficult for non-aboriginal people to understand, much less interpret or apply in a scientific form.
(2) the gathering of traditional environmental knowledge data using scientific concepts as the framework. The information is then translated into English, often without making the effort to examine whether or not the scientific terminology accurately reflects the indigenous concepts being described.
(3) the perception by scientists and wildlife managers that any indigenous system that existed in the past is no longer applicable today.
(4) the need to recognize traditional knowledge as a credible source of information for environmental assessment and resource management. Because of its qualitative nature, traditional knowledge is regarded by many scientists to lack scientific rigour and objectivity.
(5) identifying what role traditional knowledge and western science should each play in the environmental management process. The effective use of traditional environmental knowledge is the "property" of those who possess and understand it, and these people are most able to document and apply it effectively.

When these principles are understood and accepted, the application of traditional environmental knowledge in a modern management context can be accomplished by cooperative effort between the aboriginal user and the appropriate administration".

During the last few years, the Dene Cultural Institute has promoted the recognition of traditional environmental knowledge and participatory research at the territorial and federal levels of Canadian government and within international agencies and local non-governmental organizations.

At the territorial government level, the Institute was instrumental in lobbying for the establishment of a Ministerial Committee to determine how traditional knowledge can be better integrated into government programs. At the federal level of government, the Institute has been involved in the Federal Environmental Assessment Review Office's (FEARO) evaluation of the present environmental assessment process, specifically as it relates to the needs of aboriginal peoples and the recognition of traditional knowledge.

At the international level, DCI hosted a workshop in late July 1990 under the auspices of the International Development Research Centre (IDRC) to examine how participatory community research projects from diverse parts of the world are documenting and applying traditional knowledge. Participants came from Thailand, Brazil, the Solomon Islands, Norway, Britain, Mali and the eastern and western Northwest Territories. It was the first of its kind bringing together non-aboriginal and local aboriginal researchers from around the world with Dene elders. One of the most important outcomes of the workshop was the realization that despite the range of project orientations, the groups shared many common methodological problems in the documentation of traditional environmental knowledge. However, in terms of application, participants learned that they were indeed in very different socio-political and ecological situations and that what they could compare at this point was limited.

Under the auspices of the Canadian International Development Agency (CIDA), the Dene Cultural Institute is presently coordinating a joint project with Colombian aboriginal and environmental groups to develop a data base and source book on activities and issues regarding traditional environmental knowledge and conservation in the Americas. This project is expected to lay the foundation for a data base and information network that is of continuing utility and could also be expanded outside the Americas.

The Dene Cultural Institute has also been active in the area of education and curriculum development. Working with the Department of Education, the Institute, in conjunction with local research consultants from Ft. Good Hope prepared a handbook for northern teachers which presented ideas for integrating traditional environmental knowledge into the present social studies curriculum for the Northwest Territories. The Institute was also instrumental in affecting changes to the Junior High science curriculum. Henceforth, traditional knowledge should be integrated into all science topics where it has relevance. The Institute also assisted the Northern Heritage Society to develop a field school science curriculum for young northerners which included an important component on the integration of traditional environmental knowledge and western science and how to conduct participatory community research.

Other traditional knowledge research and documentation initiatives of the Institute (in partnership with the Arctic Institute of North America) include a case study on the traditional justice system of the Dene in Lac La Martre and the identification of materials used traditionally for medicinal purposes in two Dene Regions. Future projects include other case studies on traditional governance systems and traditional knowledge and responses related to climate change and variability.

CONCEPTS FOR ALL PROJECT IN SCIENCE -- CAPS (ALASKA)

Grade Level: 7-12

Contact: **Emma Walton, CAPS Co-Project Director**
Anchorage School District
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Anchorage, AK 99519-6614

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In a major effort to move science education from an overemphasis on unconnected facts and toward putting science in a larger context which enables students to relate science to themselves and their lives, the National Science Teachers Association launched the Scope, Sequence and Coordination of Secondary School Science (SS&C) Project. The Concepts for All Project in Science (CAPS) involving the Anchorage, Matanuska-Susitna, Fairbanks and Alaska Gateway School Districts in Alaska is one of six SS&C sites nationally. The others are in California, Texas, Iowa, North Carolina and Puerto Rico.

The main thrust of CAPS is to identify and/or develop curriculum, retrain teachers, and develop effective cooperative teaching strategies which

will change what and how science is being taught to all students. Key features of CAPS/SS&C are: a **scope** which enables all students to study all sciences (biology, chemistry, earth science and physics) every year and to focus on fewer topics at greater depth; a **sequence** which provides for hands-on experiences first with terminology, symbols and equations later, builds concepts through repeated experiences in different contexts, and applies science to personal and societal problems; **coordination** focusing on multidisciplinary integration and connections via unifying concepts, content core which utilizes developmental and age-appropriate sequence, multigraded classrooms and the learning cycle model; and **assessment** which evaluates depth of understanding, not just facts, and through using real objects and phenomena, assesses why students believe something, how they know it is correct and what terms mean.

Anticipated outcomes of SS&C and CAPS include: a far more scientifically literate citizenry; more students, especially female and minorities, studying science at advanced levels; greater understanding of scientific content; new approaches to textbooks and instructional materials; more effective forms of assessment of student learning; and improved materials management and planning loads for teachers of multiple subjects and/or multiple grades -- especially rural teachers.

ALASKA STATEWIDE HIGH SCHOOL SCIENCE SYMPOSIUM (ALASKA)

Grade Level: 9-12

Contact: Dr. Gary Laursen or Mr. Doug Schamel
College of Natural Sciences
Dept. of Biology and Wildlife
University of Alaska Fairbanks
Fairbanks, Alaska 99775

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The First Annual High School Science Symposium (1990) evolved out of a concept developed at West Valley High School in Fairbanks. It has since evolved from a local, through a regional, to a statewide venture (1992). Its intent is to provide a local opportunity, developed through the University of Alaska Fairbanks, for senior high students to explore science, utilize the scientific method in developing research projects, conduct the planned research, then report results in the fashion of a bonafide scientific meeting. After oral presentations, a formal scientific paper is written and submitted for review. Abstracts of student research projects are published.

Jointly sponsored by the Fairbanks North Star Borough School District and the University of Alaska Fairbanks, the program depends on extramural funding from private and corporate state businesses; local, state and national foundations and associations; and civic organizations. Industry supplies science mentors and employment counseling as well as financial assistance. The University is providing full-year tuition scholarships to top prize winners, science mentors, and a glimpse of advanced learning opportunities. The school district provides support to cooperating teachers and does printing and mailings. Parental involvement is also encouraged and rewarded.

Nominator Dr. Gary Laursen originated the project idea as a science teacher at West Valley High School. He continues to teach at West Valley while jointly holding an associate professorship at UAF's Biology and Wildlife Department. Laursen states that as a result of the Symposium "the traditional hiatus that has always persisted between high school and college level expectations as seen in our students is also seen to be shrinking". Paul Reichardt, Dean of the UAF College of Natural Sciences, wrote in a letter of recommendation to the Clearinghouse "the Symposium has had positive effects on science and math education well beyond the impact on student participants. It has provided a way for University faculty to become involved with high school students as mentors and advisors. Furthermore, through projects, judging, and the banquet, it has provided an opportunity for university and high school educators to build relationships and forge alliances."

NOME-BELTZ HIGH SCHOOL FISHERIES PROGRAM (ALASKA)

Grade Level: 9-12

Contact: **George Ihly, Principal**
Nome-Beltz High School - Box 131
Nome, Alaska 99762

phone: 907-443-5201 fax: 907-443-3626

The Nome Beltz High School Fisheries Program is a cooperative project between the school, the U.S. Department of Interior, U.S. Bureau of Land Management (BLM) and the Alaska Department of Fish and Game (FRED). The idea for a hatchery at the high school began several years ago when major decreases in salmon populations became evident to community residents. This concern coincided with the school district's search for additional ways of improving science education at the secondary level.

The program, begun in the fall of 1990, is designed to provide local high school students with opportunities to learn about salmon fish hatchery operations and successful stream enhancement procedures. Other goals are to expose students to conservation concepts and to build an appreciation of the delicate balance of the arctic ecosystem and the role fish have in that ecosystem. The "final goal" is to educate a new generation of natural resource users -- whether for subsistence, recreation or commercial purposes -- and to steer young people away from being abusers of the ecosystem.

Program activities include set up and monitoring of two living stream environments, an annual egg take and fertilization field trip, monitoring of stream temperatures and water levels, charting daily water temperatures, water testing and exchanging, periodic filter adjustment, egg/fry examination at various stages of development and releasing of fry. Students study fish anatomy and life cycles, conduct individual research and, through field trips and experiments, consider man's impact on the environment from mining and other activities. A benefits/cost analysis of hatchery vs. wild salmon production is also conducted. Students from several elementary classrooms visit and are involved in projects with the high school students teaching them in small groups.

EXEMPLARY PROGRAMS - INTERDISCIPLINARY APPROACHES FOR THE ELEMENTARY LEVEL

BAFFIN DIVISIONAL BOARD OF EDUCATION: Piniaqtavut Integrated Program (NORTHWEST TERRITORIES)

Grade Level: K-9

Contact: **Fiona O'Donoghue**
Baffin Divisional Board of Education
Box 1330
Iqaluit, NWT X0A 0H0 CANADA

phone: 819-979-5236 fax: 819-979-4868

In response to the wishes of the public and educators in the Baffin and the limitations of the existing curricula, the Baffin Divisional Board of Education began several years ago to develop a program to meet the cultural, linguistic and academic needs of its students. The major goals of Piniaqtavut are the development of bilingual communication skills, pride in cultural identity, responsibility and independence.

A HyperCard stack created by BDBE staff member Sandy McAuley to introduce new teachers to the program describes how "the interaction of the Inuit world view with cultural identity and social customs, the cycle of the seasons, history (past, present and future) and geography (local, regional, NWT, Canada, world) form the philosophical base for Piniaqtavut. This philosophical base underlies a developmental learning framework of how children learn which spirals upward and outward to provide appropriate learning experiences for a child's age and cultural background.....The Piniaqtavut Program suggests thematic units for each grade that are consistent with the underlying philosophical base and developmental learning framework".

Acting on the Board's philosophy as outlined in Our Future Is Now, a group of educators met in Iqaluit in May, 1987 to begin working on a program of studies which was released in May, 1989. During this process it evolved from an attempt to simplify and integrate existing curricula to its current form. The Teaching and Learning Center in the Board offices in Iqaluit began by producing prototypic Piniaqtavut boxes including Polar Bears, Dogs and the Inuit and Living Things. Piniaqtavut kits recently developed or under development by the BDBE Office staff include Galaxy Beyond for 8-9 (10) physics which will be inserviced in the fall of 1992; Weather based on five Inuit seasons; Baffin Bugs; SeaShore; and Central American Cultures (part of Other Ancient Cultures which complements study of the ancient Thule and Dorset cultures of Baffin).

While the Centre still produces prototypes, the Board has determined that the Piniaqtavut program will become too static if all materials emanate from its Iqaluit offices. The goal is a dynamic process and the key is for each teacher to plan and organize activities around their students' interests.

Limitations of the Piniaqtavut approach include difficulty in finding resource materials and budget restrictions which limit bringing elders into the school. Piniaqtavut theme planning is easier in the smaller communities particularly because education committees have allowed for planning time during the school week. At the Joamie School in Iqaluit, Inuktitut language teachers meet every Thursday night from 7-9 on their own time. All the Joamie teachers get together on Sundays for planning.

The commitment to Piniaqtavut is strong and ongoing. Many BDBE staff state that because of Piniaqtavut, kids are getting skills better and school "works better" for kids and teachers. The program is respected by parents, especially the cultural activities.

YUPIK ARTS FESTIVAL (ALASKA)

Grade Level: All

Contact: Paul T. Albert Memorial School
Tununak, Alaska 99681

phone: 907-652-6827

The Yupik Arts Festival encourages the preservation of traditional Yupik arts through cross-generational interaction, reinforces the traditional Yupik value of respect for the wisdom of elders, increases community involvement in the school, and provides non-Native teachers an opportunity to become familiar with traditional Yupik arts and teaching/learning styles.

A committee of elders determines which traditional arts will be taught to K-12 students during the week-long festivals. School staff and elders work together to gather the required materials prior to the festival. Students each select four traditional arts on which they would like to focus. A variety of learning stations are set up where students spend a week working in 90-minute blocks to learn the skills they selected. During the week students also perform traditional Yupik dances and a feast of traditional food is shared.

The Spring Yupik Arts Festival is scheduled for the last week of March. Most materials for this event must be ordered from retail sources. The Fall Yupik Arts Festival is scheduled for the third week in September, a time when raw materials are available locally and traditional fishing activities have concluded.

In a letter of recommendation accompanying the nomination, Mark Charlie, Director of the Tununak IRA Council, said: "I have talked to the staff about the program and it helps them get an understanding of their role in teaching native classes. It helps them get a perspective from the elders, who are used as resources, and from the students, who are at the learning end.....The parents and the whole community is invited and the students get to display and talk about what they have learned from our elders. And this can only lead to opening communication between the elders, students and the community".

SCIENCE THROUGH VISUAL AND CULTURAL LEARNING (U. S.)

Grade Level: K-12

Contact: Carolyn A. Petty
Integrating Science and Art
12014 Irvine Avenue, N.W.
Bemidji, Minnesota 56601

phone: 218-243-2456

- When children like science, they learn science.
- Most elementary age children create art outside of school for fun -- very few do science for fun.
- Learning science in a cultural context makes the content relevant and interesting. It also provides strong role models.
- When children integrate science with art, they develop and use their processing and thinking skills.
- Children explore multiple solutions when they connect science with multicultural arts. They learn to see themselves as good problem-solvers, building higher self-esteem.

The goal of the Science Through Visual and Cultural Learning approach is to connect children's natural curiosity and sensory learning with the content and processes of science. The children's own art and culture become the connectors.

Carolyn Petty works with many school districts, helping them create practical materials that expand existing curriculum, making it more meaningful -- and more fun for both teachers and children. She provides inservice, workshops, training of teacher teams, and mentoring that integrate western science with traditional arts and technologies, traditional scientific knowledge, and indigenous languages.

Carolyn's workshops and curriculum projects, which annually involve more than 3,000 students, teachers and community members, have grown out of her own global interests, her appreciation for scientific accuracy, and her delight in the creative expression of children. She works with teachers and parents, students and elders to identify the human and natural resources of an area and to develop programs which reflect the strengths and diversity of each community.

Projects often include the preparation of Resource Booklets composed of approximately 15 units, each 5-10 pages long. Each unit relates to a science topic in the participating school's scope and sequence. Units are illustrated by Carolyn and by local artists when possible. Units contain questions that encourage multiple solutions; stories, legends, indigenous language and traditional art forms; fascinating facts that make science come alive; activities that connect traditional arts and culture to science concepts; and metacurriculum to connect processing skills to science and art. Parents and children develop science kits to accompany the units.

A typical unit on Animal Adaptation explores the questions:

- I wonder how and why the beaver has adapted to water?
- I wonder how my people adapted their hunting ways to the beaver's adaptations?
- I wonder how they used beavers?
- I wonder if I could write a story about beavers using some words from my language?

Through stories children study legends and facts about the beavers in their area. They learn facts about the special adaptations of water animals, birds, predators and prey by observing animal skulls. They learn how their people interacted with these animals. Through activities children learn about beavers and other animals in the art of their culture and produce art pieces of their own. They are encouraged to follow the art of the traditional work, but be creative. They may write a few sentences explaining how the beaver has adapted to its environment or they may create their own legend to illustrate their art piece and tell how the adaptation came to be. Children identify the processes they used -- observation, analysis, recording, comparison, classification, inference, interpretation, recalling and applying knowledge, space (shape) identification. Parents and children create a kit with skulls, fur, and "footprints".

The Resource Book approach was developed through a grant from the Blandin Foundation of Minnesota, where Carolyn is working with 1000 children in ten Ojibwe Indian schools. She is also working in Alaska with the Lake & Peninsula School District. In addition to the program Science Through Visual and Cultural Learning, Carolyn does individual science/art workshops on Animals, Habitats, Humans, Math, Invention, Structures, Earth Science, Physical Science and Secondary Science.

EXEMPLARY PROGRAMS - INTERDISCIPLINARY APPROACHES FOR THE SECONDARY LEVEL

SALMON BERRY SHOP: A Native Youth Entrepreneurial Project (ALASKA)

Contact: Douglas McCoy, Executive Director
Yvonne Dazee', Program Director
Nome Community Center, Inc. - P.O. Box 98
Nome, AK 99762

phone: 907-443-5259 fax: 907-443-2042

A consignment craft shop, The Salmon Berry Shop, provides jobs and training for Alaska Native youth giving them business management and operation experience which can be used throughout their lives to secure employment or operate their own small businesses as adults. Skills in management, accounting, sales and public relations are taught and practiced as youth take responsibility for the operation of the business under the direction of an experienced business operator.

The shop accepts, on consignment, a variety of local items not available in other Nome businesses. The Native Youth Entrepreneurial Group also seeks to encourage the development of local arts and crafts, as well as other services not presently offered in Nome. An operations manual is being produced for use by other Native and non-Native organizations wishing to replicate the model. Experienced staff and youth are available to provide further training and assistance.

A key component of the Native Youth Entrepreneurial Training project is the building of self-confidence, self-esteem and positive life skills. Through individual and group counseling, support and crisis intervention, the staff is able to address a wide variety of needs and negative behaviors, including use of alcohol and other drugs, problems in interpersonal relationships and destructive activities. Beyond basic business training, young people are offered many other opportunities for participation in learning activities including video production, creative writing, AIDS prevention training and presentations, convention services, factory production of food products, and community projects.

Youth who have failed in every program are now leaders and teachers. Community involvement and support have slowly developed and possibilities for joint ventures and the development of services needed in the community -- such as broadcasting community news on the cable station, producing videotapes for local groups, providing convention and public relations services -- are being realized. Expansion to include additional Native and non-Native youth through the Job Training Partnership Act and development of an Upward Bound educational component through the University of Alaska Fairbanks is increasing the impact and breadth of the program. The creation of a food product (sourdough mix) for marketing in Alaska through a distributorship has added a new dimension which also provides some income.

In a letter to the Clearinghouse, Josie Morrow, General Manager for the Nome Eskimo Community, writes:

> "(We are) the tribal government of the almost 3,000 Alaska Natives in the Nome, Alaska area. One of the major concerns of our tribe is the quality of educational attainment for <u>all</u> our children. In 1989 the Nome Community Center, Inc. visualized a unique and practical approach for educating our older children who had dropped out of the more traditional school systems and were considered unreachable.....The students plan, develop and market their own programs. They do find joy in learning and many of them go on to complete their high school education.....I speak on behalf of the staff and Council of Nome Eskimo Community that the Native Youth Entrepreneurial Group be nominated as the exemplary program for the indigenous population in the Bering Straits Region. These kids deserve the experience and the recognition."

ELITNAURVIK WITHIN EAST PROGRAM: A Place To Learn

Grade Level: 9-12

Contact: Agnes Baptiste, Director
E.W.E. Program - East Anchorage High School
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Elitnaurvik is a Yupik term meaning "a place to learn". Elitnaurvik Within East, an alternative secondary program, was started in 1988 because of the high dropout rate among the Alaska Native and American Indian students within the Anchorage School District. The program serves approximately 225 students throughout the school year and is characterized by:

- an Alaska Native and American Indian emphasis in curriculum offering and activities;
- student responsibility;
- individualized and independent learning;
- flexible scheduling, including an extended day and an after-school program which includes Native Culture Club, Native Youth Olympics, N.C.C. basketball, field trips, a dance group and an annual retreat, Awards Banquet and Native Emphasis Week involving the entire East High School student body and faculty;
- cooperative learning;
- extensive community involvement; and
- a co-op work component.

E.W.E. is open to all students, both Native and non-Native, and has more student applicants than it can accept. Program goals include increasing the percentage of Native students who graduate; improving attendance and achievement; enhancing Native cultural awareness, appreciation and self-concept; providing educational opportunities structured for a variety of learning styles; providing career guidance; and increasing parental involvement in the education of Native students in both the academic and cultural realms. E.W.E. also helps students bridge the gap in academics and attendance from rural or urban standards.

CAMA-I: Community and Culturally Based Communications (AK)

Grade Level: 5-12

Contact: Ann Vick, International Director
Roger Lang Clearinghouse for Circumpolar Education

CAMA-I emphasizes student involvement and decision making in activities which build academic skills, draw from, and have applications within, the community outside of the classroom. This approach to learning engages students in the collection and publication of information on their community and cultures as a means to develop basic communication skills.

A key component of CAMA-I is peer teaching with experienced students introducing others to the skills and process behind the publications, videotapes, exhibits or other "products".

During the 1970's and early 1980's, Ann Vick assisted with the development of CAMA-I programs at Bristol Bay High School, Bethel Regional High School, Kodiak High School, Craig High School, Nunapitchuk BIA Day School and four high schools (Hooper Bay, Emmonak, Alakanuk and Mountain Village) in the Lower Yukon School District. Prior to coming to Alaska, she worked with FOXFIRE programs among the Mississippi Choctaw, the Oglala Sioux, the Ramah Navajo and the Salish-Kootenai of Montana. In 1982, The Cama-i Book, an anthology drawn from 4,000 pages of information which had been published by 800 students in eight Southwestern Alaska communities during a five-year period, was released by Anchor Press/Doubleday. A majority of the contributors to The Cama-i Book were Alaskan Natives. Their average age was fifteen.

EXEMPLARY PROGRAMS IN TEACHER TRAINING

SAAMI COLLEGE / SAMI ALLASKUVLA (NORWAY)

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Background

Saami College had its origin as the Saami Department of the regional teacher training college in Alta. In 1989 the department became an independent college in Guovdageaidnu. There were two primary reasons for establishment of the Saami College -- on the one hand to create a college with a "Saami environment" in terms of language, culture and content, and on the other hand to develop a Saami college with a variety of courses and programs in higher education, not just teacher training.

The main idea behind the College is expressed in the phrase, "the Source of Saami Education". The College's major purpose is "to educate different kinds of highly qualified teachers and other graduates with special competence. All education is to be based upon the needs of Saami society, both today and in the future".

Students and Staff

During its first year as an independent college, 1989-90, Saami College enrolled about 50 students. For the 1992-93 school year it has an enrollment of

almost 160 students, though a number of them are part-time. Most of the students come from the Norwegian part of Saapmi (Saamiland -- earlier known as Lappland). But, as the College is meant for Saami-speaking students from all Nordic countries, it also enrolls students from Finland and Sweden. In the 1992-93 school year, there are seven students from Finland and none from Sweden.

The College has a staff of 28 people for the 1992-93 school year. This number includes both permanent and temporary staff. In addition there are four people connected with other institutions who are currently working at the College.

All students and staff must be fluent in the Saami language, as the majority of the classes are conducted in this language. It has been, and still is, necessary to engage some staff who don't speak the language, but no permanent appointment is made to the faculty until language fluency is proven.

Courses and Programs

The courses and programs offered in the 1992-93 school year are the:

- classroom teacher training program;
- kindergarten (preschool) teacher training program;
- preprogram for students of journalism;
- Saami language courses; and,
- courses in Saami handicrafts/decorative arts (duodji).

All students must also take an introductory course in "learning morality". This course is unique to the Saami College and includes study skills, an introduction to computers, process writing, how to function in groups (cooperative learning), communication skills, library orientation, and discussion of Saami identity ("our place in society and our duties and responsibilities").

The introductory course also includes a "get together day". This day is spent outdoors in the woods near the college and includes the students and staff engaging in some traditional Saami everyday activities.

Classroom Teacher Training Program

Beginning with the 1992-93 school year, classroom teacher training is a four-year program. It includes mostly compulsory courses, but students do have some elective choices. In total, the program requires 80 credits for graduation.

The compulsory courses are (number are credits in brackets):

- Saami language (20);
- Norwegian or Swedish or Finnish language, including 5 credits on multilingualism and second language learning (10);
- pedagogical theories (10);
- nature, society and environment (10);
- mathematics (5);

- religious studies (5); and,
- practical and esthetic subjects (10), including 10 credits in Saami handicrafts/decorative arts (duodji) or 5 credits in Saami handicrafts/decorative arts (duodji) and 5 in music.

The compulsory courses include practice teaching in local schools twice a year. The elective ten credits can be chosen from:

- physical education (5 or 10);
- music (5 supplementary or 10);
- Saami handicrafts/decorative arts/duodji (5 supplementary);
- home economics (5 or 10);
- English language (10);
- mathematics (5 supplementary);
- religion (5 supplementary);
- special pedagogy (5 or 10);
- teacher-produced instructional materials (5 or 10);
- nature and environment (5 supplementary); and,
- society and environment (5 supplementary).

Kindergarten (Preschool) Teacher Training Program

This is a three-year program for those who want to work with children from birth to the start of school. The program requires 60 credits for graduation. The compulsory courses are:

- pedagogical theories/teaching methods/practice teaching (25);
- Saami language (10);
- Norwegian language (4);
- Saami handicrafts/decorative arts/duodji (3);
- social studies (3);
- music (3);
- religious studies and ethics (3);
- natural studies (3); and
- physical education (3).

Social studies has an emphasis on teaching students how to analyze society and what position the kindergarten has in society and also on how to transfer Saami culture into classroom activities. Music focuses on music in general, on traditional Saami music (juoigan), and also on other ethnomusic. Religious studies and ethics is about Christianity and other faiths, about Saami religion and church history, about ethics and secular philosophy, and about children and faith. Natural studies emphasizes the traditional Saami relationship to nature and the environment, and includes flora and fauna in the local environment. Physical education has a focus on traditional Saami sports. Students are also required to practice teach in local kindergartens every year.

The Saami education system is strongest in early childhood education and this has particularly blossomed since the early 1980's. At present, the kindergarten program provides more flexibility and opportunity for integration of Saami culture and values than does later grades. Teachers

design kindergarten programs annually and then discuss the plans with parents.

Preprogram for Students of Journalism

This is a one-year preparatory program for students who want to work in Saami media. After this year they continue with a two-year program in journalism at other colleges. The Saami College has made arrangements with three colleges in Norway, Finland and Sweden where students are allowed to do their practicing in the Saami language.

In the preprogram students have to take 10 credits in Saami language and 10 credits in social studies, with an emphasis on Saami society. This program also includes a four-week internship in Saami media.

Saami Language Courses

The College offers four different courses in Saami language, in addition to courses which are part of the programs described above. These courses are:

- Saami language - first 10 credits;
- Saami language - second 10 credits;
- Saami language for administrative staff (10 credits); and
- Saami language at the high school level, which brings the students to the level necessary for studying at the Saami College.

Courses in Saami Handicrafts / Decorative Arts (Duodji)

Two different courses are offered: Saami handicrafts/decorative arts (duodji) - first 5 or 10 credits and Saami handicrafts/decorative arts (duodji) - second 10 credits.

Duodji is divided into two main catagories, "hard" and "soft" duodji, and the courses include some from both. Hard duodji concentrates on working with antlers, bone and wood; soft duodji on working with reindeer skin, weaving, tin thread embroidery and sewing of traditional Saami clothes. The courses focus both on theory and practice.

Research and Development

The staff at Saami College has to do a great deal of research and development, especially in relation to the needs in Saami society. Two of the central topics are working with Saami terminology for different subjects and developing content and forms for the Saami education system at different levels.

Library

The library of the Saami College intends to serve students and staff with all of their general literature needs. The library has begun to build a special collection of teaching materials in the Saami language and about Saami life. In the future there will also be emphasis placed on literature about bilingualism and multilingualism, as well as on education policy among indigenous peoples, especially in the North.

AMERICAN INDIAN SCIENCE AND ENGINEERING SOCIETY (U.S.)

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Founded in 1977 by a group of American Indian scientists and engineers, AISES is a private, non-profit organization which seeks to significantly increase the number of American Indian scientists and engineers in the nation and to develop technologically informed leaders within the Indian community. Presently AISES provides precollege, college, teacher, research and development, professional and community programs in order to achieve this goal. The Society maintains a communications network among American Indian tribes and leaders, educational institutions at all levels, agencies, and educational professionals, both Indian and non-Indian, which supports and assists all program activities.

PreCollege Programs

The objectives of AISES PreCollege Programs are to:

- stimulate the interest of American Indian students in mathematics, sciences and engineering both academically and socially;
- help the students assess their potential skills and abilities in science and mathematics;
- increase the students' knowledge and performance skills in science and mathematics;
- enhance the students' confidence in their abilities and opportunities in mathematics and the sciences, both in school and in the job market;
- acquaint students with applications of mathematics and sciences in the "real" world;
- prepare students for cultural challenges away from their traditional environment;
- encourage parents of the participating students to support the academic pursuits of their children; and
- influence the Indian community toward higher academic expectations for their young people.

Over the last seven years, more than 750 students from over 100 tribes, including several Alaskan young people, have attended math and science camps on various university campuses. Additionally, PreCollege Programs promotes science fairs in more than 60 Indian schools and organizes an annual National American Indian Science and Engineering Fair.

Teacher Programs

Teacher Programs serve math and science teachers from schools with significant populations of American Indian students. Programs are designed

to strengthen teachers' understanding of math and science concepts and to enhance their instructional skills. Teacher programs emphasize culturally-relevant hands-on science with an interdisciplinary approach. To date, Teacher Programs have served more than 700 teachers of American Indian children.

The focal point of AISES' activities, the Annual National Conference, brings together American Indian students, scientists, engineers, teachers, major U.S. corporations, and universities every November. Many of AISES 400 professional members, American Indians in the science and engineering professions, attend the conference. The 1991 Conference in Albuquerque had over 3000 participants. The 1992 Conference will take place in Washington, D.C. and the 1993 in Spokane, Washington.

Publications available from AISES include its award-winning quarterly magazine, Winds of Change, which disseminates information on educational and occupational opportunities and promotes the involvement of Indian and non-Indian professionals in Indian concerns. Winds of Change has a quarterly circulation of 50,000 subscribers. AISES also publishes a quarterly Education Newsletter with news of its activities, announcements of new programs and training opportunities and reviews.

Science of Alcohol Curriculum for American Indians (SACAI)

Developed under a grant from the Fund for the Improvement of Post Secondary Education, the Science of Alcohol Curriculum for American Indians (SACAI) is an alcohol prevention program based on traditional Indian problem-solving approaches combined with contemporary science. The curriculum is presented from a holistic model based on the Medicine Circle, a traditional symbol of wholeness and balance, and the new science paradigm, a perspective of science that emphasizes nature's interdependence. Relationships of the physical body to the emotional, mental and spiritual aspects of life are emphasized and the "part" is examined in the context of the "whole".

The SACAI series consists of three units:

- Bridging American Indian Culture with the New Science Paradigm;
- The Digestive System and Alcohol Use; and
- The Central Nervous System and Alcohol Use.

Each unit includes background information; handouts and ready-to-use transparencies; activities and discussion questions; and a participant booklet. The Bridging unit provides a grounding in alcohol issues, the new science paradigm, and the Medicine Circle concept and should be used first.

Currently, SACAI training is appropriate for teachers, counselors, principals, and other educational personnel who have a background in biological science. AISES is in the process of adapting the SACAI materials for use in the secondary classroom and among community groups.

YUKON NATIVE LANGUAGE CENTRE (YNLC)

Contact: **Ms. Jo-Anne Johnson, Programs Coordinator**
Yukon Native Language Centre
Yukon College
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The basic goals of the Yukon Native Language Centre are to teach, document and promote Yukon native languages (Gwich'in, Han, Northern and Southern Tutchone, Kaska, Tagish, Tlingit and Upper Tanana); provide training for language instructors; develop sound teaching and reference materials for all Yukon languages; and record Yukon Native traditions and oral history. Administered by the Council for Yukon Indians, the Centre's staff members have been involved since 1977 in recording, analyzing, and teaching the native languages.

Centre activities include:

- providing practical and technical assistance to native language programs operating in Yukon schools. The programs are run cooperatively by the school and the community and are generally offered in the elementary and intermediate grades. They are all second language programs and are taught as oral programs, striving to expose Native and non-Native students to the language and culture of their communities and encouraging them to use the language outside of school;
- adult classes including literacy training for those who wish to write their own languages as well as conversation courses;
- a three-year Certificate Course for Native Language instructors which emphasizes basic methods of oral language teaching and includes components on language structure, child development, local studies, professionalism, and an introduction to native literacy. Program participants have come from the Yukon, British Columbia, Northwest Territories and Alaska;
- compilation of dictionaries, stories told by Elders, place names and Native personal names. YNLC publishes a number of titles in linguistics, folklore, oral history, adult native literacy, and Athapaskan second-language teaching. A publications list is available from the Centre.

Centre Director John Ritter has recommended two school programs to the Clearinghouse as Exemplary Programs for 1992-93:

Athapaskan 11 and 12, a two-year sequence of courses in Southern Tutchone Language and Culture offered at the F.H. Collins Senior Secondary School in Whitehorse, Yukon. Courses include intensive language learning, units on comparative Athapaskan linguistics, visits by local Elders, and field trips to areas of local cultural interest. These courses are accepted for language entrance requirements at the University of British Columbia, the University of

Victoria, and the University of Alaska Fairbanks. The instructor, Mrs. Margaret Workman, can be reached at the Yukon Native Language Centre.

Kaska Language Curriculum Project, an on-going collaboration between the schools and communities of Ross River and Watson Lake, Yukon. Kaska is the local Athapaskan language and is offered as an elective in grades K-10, with expansion to Grade 12 gradually being phased in. The Curriculum Project develops innovative materials and field tests them in both communities. Participation by local Elders, cultural exchanges, and on-the-land activities are prominent features of the program in these communities. The project leader is Mr. Pat Moore, a YNLC Kaska Language Linguist. He can be reached c/o Ross River School, Ross River, Yukon, 403-969-2216 or 969-2536.

MASTERS - Math And Science TEachers for Reservation Schools

Audience: **Elementary School (K-9) Teachers of Native Americans**

Contact: **Walter S. Smith, Director**
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University of Kansas
Lawrence, KS 66045

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MASTERS is designed to improve the science and math teaching skills of elementary teachers of Native Americans and through these teachers to improve the math and science skills of their students. Project participants and staff have found that the extensive, intensive focus on culturally-relevant, hands-on science and math instruction does enable teachers to change their mode of instruction from read and recite from textbooks to collection, interpretation, and application of firsthand experience. And the instructional leadership portion of the program is producing teachers who can be "change agents" in their schools.

Each summer approximately 45 teachers come to Lawrence, Kansas for eight weeks to engage in math and science education coursework that emphasizes key themes of using culturally relevant instruction, teaching to all senses (including the ideas of hands-on science and using manipulatives in math), involving the community in the schools, and applying relevant national recommendations from organizations such as the National Council of Teachers of Mathematics and National Science Teachers Association. Two-thirds of the teachers directly focus on these themes; the other third who are attending the program for the second or third summer focus on development of instructional leadership skills that will enable them to assist their schools to improve math and science instruction.

During the following academic year, the first year participants apply their new skills in their classrooms. The second year participants carry out a practicum designed to solve a specific problem such as the underutilization of math manipulatives by primary teachers or lack of coordination of the math and science curriculum across the grade levels. The third year participants undertake research about a problem facing their schools. They may, for

example, investigate the effect of culturally relevant instruction on student learning.

Applications for the 1993 program (limited to U.S. teachers) will be available January 15, 1993 with a due date of March 1. The program, funded in 1988-89 and 1991-93 by the National Science Foundation, provides participants travel to and from Kansas, room and board, almost all tuition, all textbooks and materials, and a weekly stipend of $300. Teachers are also provided support and supervision by program staff during the academic year. The program currently receives over 150 applications per year and can accept about one in three applicants. Seven Alaskan teachers have participated in the MASTERS Project to date.

In late 1992 MASTERS will be publishing a 120-page book of six thematic units for grades 2-9 with each unit containing a biographical profile of a Native American. The book, which will cost approximately $10 for a single copy and less for multiple copies, can be ordered directly from the program.

EXEMPLARY PROGRAMS IN EVALUATION AND SCHOOL DISTRICT REORGANIZATION

Learning, Tradition and Change: A Report on All Aspects of Educational Policy in the Northwest Territories

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In February 1980, during the first session of the Ninth Legislative Assembly of the Northwest Territories, the Special Committee on Education was formed in response to a motion by Tagak Curley, MLA for Keewatin South, which read:

"WHEREAS there are many educational problems faced by people of the Northwest Territories, and particularly with the Natives, including high drop-out rate, poor comprehension, poor parent/ teacher relationship, low recruitment of Native teachers and foreign curriculum for northern lifestyle, lack of proper high school facilities, and a lack of continuing and special education facilities;

NOW THEREFORE I move that this Assembly establish a special committee on education with support staff to inquire into all aspects of educational policy in the Northwest Territories and an interim report of its findings be tabled during the fall session in 1981 and the final report and recommendations be made in the beginning of 1982...."

The Special Committee was charged with inquiring into current problems and public concerns about education; reviewing all aspects of existing legislation, policy and philosophy concerning education in the

Northwest Territories and making recommendations to the Assembly for reform; consulting with residents in all parts of the N.W.T.; initiating action research projects to demonstrate new approaches to solving education problems; and recommending urgent changes in existing policies from time to time as deemed necessary.

In March of 1982, the Special Committee issued a 172-page report entitled Learning, Tradition and Change in the Northwest Territories which recommended profound restructuring of the educational system. Ten years later, virtually all of the recommendations have been implemented. Chief among the changes are the establishment of Divisional Boards of Education, Centres for Learning and Teaching (to prepare and test programs of study including instructional materials, design and train teaching staff, supervise initial stages of implementation of new programs, and conduct evaluations), and the Arctic College with "power to establish their own priorities, programs and schedules of implementation".

The Special Committee listed in the Report's introduction "certain facts and principles" which had guided their proposals and recommendations:

- "We are convinced that decisions related to the direction of learning activities in a school must be made at the community level. The community that a school serves should make as many decisions as possible about the nature and scope of the information presented, how it should be presented, and who should present it;
- "The special historical and regional conditions of the Northwest Territories can help in the planning for future programs. In the past, our small populations and the lack of a tradition of formal education have sometimes been regarded as disadvantages. We consider that the very smallness of our population should encourage the development of innovative responses to local and regional needs.....;
- "We do not think that learning is limited to instruction that takes place in schools. People are learning all their lives. By educational system we mean all of the organized instructional programs offered in the territorial schools as well as Kindergarten to Grade 10 (K-10) in-school programs. The educational system should permit individuals to join it and to leave it without seriously or negatively disrupting their lives. Adults must be able, at will to use the system for further education or training;
- "We believe that well-designed, specific programs, tailored, where necessary, to individual pupils, can and should provide effective and rewarding opportunities for learning. Instead of using theory or a model, the planner of an innovative program should base it on a community's actual needs and its own characteristics. Adequate planning can assist in the allocation of priorities, apportioning budgets, coordinating services, monitoring the effectiveness of programs and of staff, and identifying the need for specially trained staff. The educational needs of a community are the sum of its individual needs, and when they are added to a community's social, economic, and political priorities, the information necessary for a comprehensive education program is available."

Recommendations in the area of language included that each local education authority at the community level determine the language to be used in its classrooms and that funds be made available to the Divisional Boards to develop Native language programs in all subjects. In the area of teacher training, it was recommended that teacher training programs be integrated with curriculum development and offered in the communities, that communities that have chosen to have Native language instruction have teachers fluent in the language in charge of at least Kindergarten and Grades 1 and 2, and that classroom assistants be encouraged to become certified teachers.

Two subsequent documents, Education in the Northwest Territories (1990), Our Students, Our Future: An Educational Framework (1991), issued by NWT Department of Education, update the progress toward implementation of the recommendations contained in Learning, Tradition and Change in the Northwest Territories. In September 1992, NWT Minister of Education James Arvaluk announced an initiative to develop a new strategic plan updating the 1982 blueprint for use through the year 2010.

The exemplary programs of the Baffin and Dogrib Divisional Boards of Education are detailed below. Exemplary programs in the Beaufort-Delta Divisional Board (for the communities of Aklavik, Arctic Red River, Fort McPherson, Paulatuk, Sachs Harbour and Tuktoyaktuk) include the work being done at the Gwich'in Language Teaching and Learning Center in Fort McPherson and the Inuvialuktun Teaching and Learning Center in Inuvik. Both centers are developing materials for the teaching of native languages. Immersion in the local language was initiated in a couple of the Beaufort-Delta schools during the 1991-92 school year.

Outstanding among the Keewatin Board's programs (for the communities of Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Rankin Inlet, Repulse Bay and Whale Cove) is a community-based teacher education program which is underway in three communities at present. The Board expects to have half of its teaching personnel hired from native Inuit applicants within five years.

BAFFIN DIVISIONAL BOARD OF EDUCATION: The Future is Now

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Change is taking place in Cape Dorset, Lake Harbour, Iqaluit, Pangnirtung, Broughton Island, Clyde River, Pond Inlet, Nanisivik, Arctic Bay, Grise Fiord, Resolute, Igloolik and Hall Beach. The number of Inuk teachers and administrators is increasing. The drop out rate for secondary students is beginning to fall. Parents are taking a more active role in school activities. Key factors in the way the Baffin Divisional Board of Education functions include:

- the structure and operation of the Divisional Board;

- the procedures used in 1987 to develop the BDBE's statement of purpose, Our Future Is Now, and the continued use of that document to guide day-to-day operations;
- language and staffing policies which reflect the communities served by the BDBE; and
- the Piniaqtavut program.

Divisional Board members are chosen by the elected Education Council (CEC) in each community from their membership. When a Divisional Board Chairperson is elected, an additional member joins the Board to represent the Chairperson's community. This allows the Chairperson to have a Board-wide perspective.

The full Board meets three times a year, the Executive Committee eight times a year. There are also Standing Committees. Meetings are conducted in Inuktitut with simultaneous translation. Each CEC has eight elected members plus a representative of the municipal government. On-the-job training is provided CEC members. Each community has a salaried Office Manager who is provided orientation by members of the Divisional Board. The Office Manager explains the Education Act to newly elected members of the CEC. The Office Manager works as staff to the CEC under the supervision of the principal. He or she also serves as liaison to the Divisional Board.

Our Future Is Now is the statement which guides the day-to-day operations of the Baffin Divisional Board of Education and is the document against which the elected Board members and staff regularly evaluate their progress. Published in 1987, it is based on a trilingual survey of what residents wanted in the schools. Each community decided how best to conduct the survey and 85% of those contacted responded. In Iqaluit, the radio, mail system and school were used to distribute information and forms. In the smaller communities, the focus was on the radio and on door-to-door surveying.

Our Future Is Now begins with an acknowledgement of the tremendous social change which has impacted the Baffin Region over the last 25 years. It continues with a recognition that "while our schools have undoubtedly had a major impact on Nunavut they have lacked a clear sense of vision. Parents are unsure of what they want from schools. Educators complain about a lack of direction. The resulting problems in our education system have been well documented elsewhere. We do know that the confusion over the purposes of schooling has inevitably affected the children in our schools, very few of whom ever graduate. This factor alone represents a tremendous waste of human potential and if our children are to assume their rightful place in Nunavut we must find ways of reversing the trend. Accordingly the development of a firm direction for our school system is the major challenge facing the Baffin Divisional Board".

A 20-page bilingual pamphlet in Inuktitut and English, Our Future Is Now includes sections on the school and its role, parental expectations of schools, the purposes of Baffin Divisional schooling, and the function and goals of the Baffin Divisional Board. A final section outlines corporate goals which expand on the issues raised in the statement and "establish the direction

to be taken by the Baffin Division in meeting the expressed needs of its constituency".

BDBE currently has about 200 teachers including 36 fully certified Inuk teachers and 50 teacher-trainees on the job while taking courses through Arctic College. In February of 1992, the BDBE's Special Committee on Inuit Education issued specific recommendations concerning administrative actions, development of language and culture programs, teacher training and community education council-teacher relations with a focus on both immediate and long-range (by the year 2000) goals.

At the forefront in the development of innovative instruction in circumpolar schools is the Baffin Divisional Board of Education's Piniaqtavut Program, a program of studies for grades K-9 which suggests a methodology and content for developing relevant, culture-based schooling for children.

The key factors described above are evidenced in the day-to-day operation of BDBE schools. Arnaqjuaq School in Hall Beach is a leader in the creation of Inuit-based education with a focus on building confidence and language skills among students, support of the Inuit staff, on-the-job training for new teachers, and regular staff meetings and training for the entire staff. Currently Arnaqjuaq School staff consists of eight teachers, five teachers-in-training and one principal for a total of 14. Four of the 14 staff are non-Inuit. Teacher-in-training status is offered to anyone who works at the school.

In Hall Beach, the Piniaqtavut process involves the staff going out on the land with elders and Community Education Council members during the last two weeks of the school year to do the planning for the coming school year. Half of the staff goes out for the first week while the rest remain in school with the students. Then they switch for the second week. During the summer the teachers and other staff collect the resources they have identified as needed for the next year's programs.

Emphasis is placed on maximum Inuktitut usage. At K-6, 100% of the instruction is in Inuktitut, at 6-7 50% and at 7-9 30% is. At K-4 students are vertically grouped into 'families' and spend most of their school day within that group. The focus is on cooperation between students of various ages and grade levels. Even the youngest are well integrated. Students of all ages readily accept and/or offer assistance to their classmates and visitors.

DOGRIB DIVISIONAL BOARD OF EDUCATION (NWT)

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Rae-Edzo X0E 0Y0

phone: 403-371-3026 **fax: 403-371-3053**

Exemplary programs within the Dogrib Divisional Board of Education (for the communities of Rae-Edzo, Snare Lake, Detah, Lac La Martre and Rae Lakes) include the Kw'atindee Bino Community Teacher Education Program where teacher interns work in classroom pods learning teaching skills "on the job". Recognized by UNESCO as an official activity of the "World Decade for

Cultural Development", the program incorporates strong elements of Dogrib language, culture, student support and advocacy, and parental involvement as part of the interns' work.

The Chief Jimmy Bruneau Regional High School in Edzo places equal value on teaching the cultural values, traditions, livelihood and language of the community and on developing the skills and knowledge necessary to manage and provide leadership for the political, economic and social infrastructures of the region. Two innovative community programs in the high school are the Goxi Gok'e (Our Ways) program in practical arts and Dogrib 15 and Dogrib 25 language courses.

A bilingual education program from kindergarten to grade two, piloted in Rae last year is now expanding to two other Dogrib communities which have bilingual teaching staff, with a comprehensive program and an expanding base of resources and literature.

PARTNERS IN EDUCATION: The Yukon Education Act

Contact: **Communications Coordinator**
Yukon Department of Education - Box 2703
Whitehorse, Yukon Y1A 2C6

phone: 403-667-5205 fax: 403-667-4754

The Yukon Education Act, passed in early 1990, is the result of almost four years of consultation, involving thousands of Yukon people. While the legislation reflects what parents and educators in the Yukon told the government they wanted to see, it also emphasizes empowerment as a response to the Canadian Charter of Rights and Freedoms. The intent is to empower parents, students and educators through the delegation of responsibility to all levels of the education system, bringing decision-making closer to the people who are affected by the decisions. The Act sets out four major partners, or stakeholders, in Yukon education -- parents, teachers, the Department of Education and students.

Parents participate through 26 elected school councils, the Yukon Education Council, the Education Appeal Tribunal and the Curriculum Advisory Committee, as well as through individual relationships with their children's teachers. An extensive training program for school councils has been launched "which will enable them to take on as much responsibility as they desire under the Act". Other change is happening, including increased professional development activities, procedures for greater local control and new appeal processes.

Another example of change and reorganization in the Yukon system is the Yukon Native Teacher Education Program. Begun in September, 1989, it was developed by the Yukon Department of Education, the Council for Yukon Indians, the Yukon Teachers' Association and Yukon College. The program is fully accredited through the University of Regina and graduates qualify for that institution's Bachelor of Education degree. Additional information can be obtained from the Yukon Native Teacher Education Program, Box 2799, Whitehorse, Yukon, phone: 403-668-8781 and fax: 403-668-8890.

NUNAVIK EDUCATIONAL TASK FORCE: Promoting and Evaluating Inuit-Controlled Education in Northern Quebec

Contact: **Sheila Cloutier**
c/o Makivik Corporation
650- 32e Avenue
Lachine, Quebec H8T 3K4

phone: 514-634-8091

Some of the most dynamic political and educational change in the circumpolar world is taking place in the Inuit communities of Canada's Eastern Arctic. As the eastern portion of the Northwest Territories moves toward creation of the territory of Nunavut, the Inuit of Northern Quebec are utilizing the powers and responsibilities guaranteed them through the 1975 James Bay and Northern Quebec Agreement to reshape the relationship of the land they call Nunavik to the provincial and federal governments.

The Kativik School Board began operations in Northern Quebec in 1978 as the first Inuit-controlled school Board in Canada. In March of 1989 at the Makivik Corporation's Annual Members' Meeting, a resolution was passed to establish an independent Task Force to evaluate the existing education system in Nunavik and to make recommendations for the future. No other school system in the Arctic has undergone such a comprehensive assessment of its strengths and weaknesses.

The Task Force's Final Report, issued in February 1992 under the title SILATUNIRMUT: The Pathway to Wisdom, recommends a major restructuring and refocusing of the education system in Nunavik emphasizing new approaches which differ from the educational framework prescribed by the Ministry of Education of Quebec. In describing the challenge facing the Inuit of Quebec, the Report describes designing an effective education system as "a process of translating community needs and aspirations into effective programs and operations. There is little point in having a clear vision and purpose that matches community needs if there is no effective way of making this vision happen. On the other hand, there is no point in having high quality programs and operations if they have nothing to do with the purposes and needs of the community. It would be like being lost, but making good time".

The Report reviews existing Kativik School Board operations in detail including sections on Instructional Programs (cultural programs, language programs, social studies, science program, mathematics, curriculum standards, achievement standards, program development); Teachers and Teacher Training; Teacher Turnover and Recruitment; Training, Support and Professional Development; Community and Parental Involvement; Student Affairs (dropouts and student involvement); Drugs and Alcohol; and Adult Education. A Report of the Activities of the Kativik School Board 1986-1992, including a response to some of the issues raised by the Task Force review and a disagreement with its conclusions, may be obtained from Kativik School Board, 331 Mimosa, Dorval, Quebec H9S 3K5.

LIBRARY AND OTHER INSTRUCTIONAL RESOURCES

KARASJOHKA / KARASJOK LIBRARY: SAMI SIERRABIBILIOTEHKKA

Contact: **Eldbjorg Gjelsvik**
District librarian
Sámi sierrsbibliotehkka / Sámisk spesialbibliotek
Niitonjargeaidnu 28,
N-9730 Karasjohka / Karasjok NORWAY

phone: 47 (084) 67 114

Sámi sierrabibliotehkka/Sámisk spesialbibliotek is Norway's only special library of Sámi literature. Funded by the Norwegian state, it collects and takes care of all materials in Sámi language or about Sámi history, culture, language, dwellings etc., wherever published and in any language. This collection currently numbers 21,000 volumes and includes books and other publications, microfilms, videos, records and maps. Rare books are also part of the collection.

As part of the Norwegian library system, the Karasjohka/Karasjok Library is obliged to lend its material to other libraries and persons including those living outside of Norway. Materials may be borrowed through interlibrary loan or by writing or calling the library directly.

The Roger Lang Clearinghouse Curriculum Library has print copies of the catalogues of the Sámi sierrsbibliotehkka/Sámisk spesialbibliotek which are updated annually. Publications and other materials are entered in the language they were published in, so English language publications can be easily identified.

CURRICULUM LIBRARY OF THE LANG CLEARINGHOUSE

Contact: **Ann Vick, International Director**
Roger Lang Clearinghouse for Circumpolar Education

The Curriculum Library is composed of materials contributed by participating institutions throughout the circumpolar North. The information is organized into six categories: math/science, social studies, language arts, educational policy, bibliographies and student-produced materials. Educational policy materials include information on curriculum development processes, school district reorganization and evaluation of educational programs, as well as copies of journal articles, unpublished reports and conference presentations.

The Library Catalogue is updated annually and copies are available in print or disk format. Contributions which arrive between updates are stored in Additions until they are integrated into the major categories. The entry for each publication includes subject and grade level, title, source, year published, culture and language, number of pages and a brief description of contents.

The computer program used to catalogue the collection is FILEMAKER PRO, a product of Claris Corporation (440 Clyde Avenue, Mountain View, CA

94043/phone: 415-960-1500). The Clearinghouse computer is a Macintosh IIsi. An important feature of FILEMAKER is that it allows you to find material by simply giving it a criteria command such as "whales" or "Northwest Territories". It will also sort the material any way you wish. You can, for example, create a file of all fisheries-related materials contained in the collection by searching under the word 'fish' in each of the six categories.

CANADIAN CIRCUMPOLAR LIBRARY

Contact: **Robin Minion, Head Librarian**
Elaine Simpson,Library Assistant
Canadian Circumpolar Library
Room B-03 Cameron Library - The University of Alberta
Edmonton T6G 2J8 CANADA

phone: 403-492-4409 fax: 403-492-4327
electronic mail (on Envoy 100): BOREAL

The Canadian Circumpolar Library (CCI Library), formerly known as the Boreal Institute Library, is a specialized library which has a recognized world-class collection. It functions both as a facility for scholars engaged in northern research and as a public information service to anyone interested in the North. The collection encompasses materials at all reading levels and in all disciplines, including fiction, consultant reports, conference papers and theses, as well as monographs, periodicals and newspapers.

Other services of the CCI Library include the Boreal Database, which is the Library's online catalogue on SPIRES, and the Boreal Northern Titles, an online database of headlines from newspapers, periodicals, government documents and other publications received by the CCI Library. A KWIC Index of English language titles and authors is available once a month in print format for a fee of $50 per year. Foreign language articles are included in Boreal Northern Titles/KWIC Index if they have an English title and summary. Copies of full articles are available at the CCI Library if they are not available locally.

The CCI Library's elementary and secondary curriculum collection is particularly strong in materials relating to the Northwest Territories and Yukon. The Roger Lang Clearinghouse Library has a computer printout of the titles in the curriculum collection, as well as of a number of titles of education-related materials elsewhere in the CCI Library. The CCI Library will do specialized computer searches of its collection for teachers and will loan most of its publications. Teachers who do not have access to inter-library loans, may contact the Library directly and request that particular publications be mailed to them.

EXEMPLARY PROGRAM NOMINATION FORM

<u>Nominations should be sent to the Lang Clearinghouse by July 1, 1993 to be considered for publication in the next edition of the Whole Pole Catalogue.</u>

Criteria for Exemplary Programs as established by the Alaska Steering Committee of the Roger Lang Clearinghouse
Place a check mark next to each of the criteria which describe your program.

I. Exemplary programs are those which **encourage family and community involvement.** Specifically, these programs:

___ • encourage strong parental and community involvement
___ • let parents become teachers
___ • validate local knowledge
___ • make use of the existing community support system
___ • encourage teachers' respect for the community
___ • are culturally relevant
___ • reflect and promote local values and beliefs
___ • make use of community resources, including facilities, and are not restricted to in-school activities

II. In their **program design**, exemplary programs:

___ • take advantage of student's learning styles and strengths
___ • build upon students' prior knowledge/learning base
___ • are presented at a level which both challenges students and is of high interest to them
___ • require accuracy by students
___ • involve students as peer teachers and/or counselors
___ • focus on depth rather than breadth
___ • look at the nature and process of fields such as science, not just the facts
___ • encourage risk-taking including using mistakes for learning
___ • encourage use of technology without damaging the environment
___ • are multi-level and holistic in approach
___ • are integrated and/or thematic in their design and mesh with other programs
___ • are appropriate for small schools
___ • encourage a variety of teaching approaches
___ • have a monitoring and/or evaluation component which focuses on learner outcome and on problem assessment rather than testing
___ • are cost-effective
___ • have been designed/developed/implemented in cooperation with indigenous populations in the circumpolar region

III. In their **learning outcomes**, exemplary programs:

___ • have hands-on, practical applications for what is learned, if possible within the community
___ • encourage social development as a contributing member of a healthy community
___ • emphasize compatibility between both individuals and groups
___ • develop academic knowledge and skills and prepare students for post-secondary education if they choose it

___ • promote understanding of factual knowledge, not just memorization
___ • promote excellence and pride of workmanship
___ • encourage students to be knowledgeable about, and aware of, the larger world
___ • help students to excel "in both worlds with one spirit"
___ • promote the joy of learning
___ • build life-long thinking skills and motivation
___ • discourage delegation of all responsibility to the schools and reliance on outside people and institutions for all the answers
___ • encourage individual and community self-reliance
___ • prepare students to take responsible positions within the home, the community and the workplace
___ • empower students and give them confidence in both village and urban situations

Name of Nominated Program _____

Subject Area(s) _____

Audience/Grade Level _____

Name of Nominator _____

Address _____

Phone _____ Fax _____

On separate sheets of paper, provide the following information:

1) Description of the program including goals and specific activities.

2) What other important aspects of your program are not reflected in the above list of criteria?

3) What is the history of the program? How and why was it created? How was the community involved in its development? As nominator, what is your involvement with the program?

4) How has the program been evaluated?

5) What are the most successful aspects of the program?

6) What are the limitations or weaknesses of the program?

7) What are the requirements for implementing the program in another circumpolar area (space, inservice, materials, supplies, administrative procedures, etc.)?

8) How do you propose to familiarize other circumpolar educators with the program? Be specific about the number of trainers and length of time needed, printed materials you have available, the approach you would take (including school visits, demonstration teaching, workshops and other activities you would propose). Will translation be required? Would this training be

conducted in your own community or would you prefer to visit schools and/or communities wishing to adopt the program? What time of year would be best for the exchange?

9) What are the estimated travel, supplies and other costs needed for this exchange/training?

Programs are encouraged to include additional supportive materials such as publications, videotapes, etc. with their nomination.

Please include three letters of recommendation from individuals in the community who are knowledgeable about the nominated program and able to assess its effectiveness.

PUBLICATIONS ORDER FORM

Newsletter (published three times a year)

Individuals: within the U.S. 15.00/yr. _____ Canada 18.00/yr. _____
International 20.00/yr. _____
Institutional: within the U.S. 45.00/yr. _____ Canada 54.00/yr. _____
International 60.00/yr. _____
Institutional subscribers receive four copies of each issue.

Whole Pole Catalogue (annual)

Individuals: within the U.S. 12.00 _____ Canada 15.00 _____ Int'l 18.00 _____
Institutional: within the U.S. 35.00 _____ Canada 45.00 _____ Int'l 55.00 _____
A complementary copy is sent to programs which are cited as Exemplary.
Institutional subscribers receive three copies of each edition.

Curriculum Library Catalogue (annual)

Print copy: U.S. 45.00 _____ Canada 48.00 _____ International 50.00 _____
Disk copy on Macintosh Filemaker Pro: U.S. 15.00 _____ Canada 18.00 _____
International 20.00 _____

TOTAL OWED (in U.S. funds) $_____

Name _____

Address _____

_____

_____

Phone _____ Fax _____

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